

Some for All? Carbon Clubs in The Context of The Paris Agreement and the World Trade Organization

Annie Petsonk and Nathaniel Keohane (with Alex Hanafi)

Environmental Defense Fund

Carbon Clubs: Brief Introduction

Efforts to avert catastrophic climate shifts have taken on greater urgency in recent years. Parallel to the development of the Paris Agreement, academics and a growing number of government representatives have expressed interest in the idea of carbon clubs — small groups of countries that share a strong commitment to climate change action and want to work together to achieve a transition to a decarbonized future. The richly-deserved recognition accorded to Professor William Nordhaus, who was awarded the Nobel Prize in Economics in 2018 for his pioneering work on integrating climate change into economics – including his ground-breaking thinking on carbon clubs – put an added spotlight on the idea that carbon clubs might be a policy path worth considering.¹

Such clubs, by channeling the climate change protection efforts of some (i.e., club members) in order to provide climate mitigation benefits that would redound to all of the planet’s inhabitants (“some for all”), could serve as an element of building blocks for climate change action, particularly if they link together institutions with missions other than climate change protection and if they focus on dominant market actors.² Clubs could be focused on a range of policy approaches, e.g., improved access to technologies such as renewable energy technologies or technologies for carbon capture and sequestration/storage.³ They might be organized to address a particular pollutant, e.g., black carbon from shipping.⁴ Furthermore, clubs might be

organized by or for a particular grouping of countries, (e.g., major emitters, highly vulnerable nations) or in an effort to overcome historical divisions between high-ambition coalitions.⁵

Club theory as originally proposed by James Buchanan provides the theoretical underpinnings for these proposals.⁶ Buchanan originally advanced his theory of clubs as a means of bridging the gap between private and public goods as the latter's infinitely large membership makes protection of them correspondingly challenging.⁷ As Buchanan saw it, "the central question" in a theory of clubs is "the optimal size."⁸ Working from this premise, some have suggested constructing climate clubs as smaller groupings of countries in order to make it easier to reach negotiated conclusions.⁹ But, as Professor Falkner notes, "a change in the bargaining context on its own is unlikely to overcome the profound interest diversity and incentives for free-riding. Getting a deal on internationally-agreed mitigation efforts is less a question of reducing the number of players than of the convergence of domestic policy preferences towards strong international action."¹⁰

Much attention has also been paid to Buchanan's focus on the exclusivity of clubs as a way to address the "free rider" problem. As he observed, "the theory of clubs is, in one sense, a theory of optimal exclusion, as well as one of inclusion."¹¹ The free rider problem arises in the climate context because, at least for climate clubs focused on reducing emissions, the resulting climate change protection benefits are non-exclusive – non-participants can enjoy the climate change protection benefits without incurring the costs of club participation. As we discuss further below, a number of proposals for climate clubs have focused on exclusivity as a means of addressing this free rider problem. But Professor Andresen's caution should be kept in mind: clubs, simply as a result of their exclusivity, are not a panacea, and their effectiveness is uneven.¹²

These caveats notwithstanding, interest in climate clubs and their design remains strong.¹³ The evolution from a top-down Kyoto Protocol to a bottom-up Paris Agreement has prompted several experts to take a closer look at clubs in the context of carbon markets.¹⁴ In this essay, we examine a subset of carbon market club questions, focusing on the usefulness of potential design elements and their compatibility with the Paris Agreement and the WTO.

Clubs of Carbon Markets: Potential Design Features

In considering design features of a club that would link carbon markets, it is worth spending a moment to clarify terms. “Carbon markets” refers to a particular subset of market-based environmental policies. In this essay, we use the term “carbon markets” to refer to systems in which an absolute, binding limit is placed on the total allowable greenhouse gas emissions of one or more sectors, with the overall cap devolved to individual emitters (i.e., facilities, companies, or other entities constituting the capped sector or sectors). Individual emitters may then meet their caps by limiting their own emissions to their allocated level or by acquiring “emission units” (which may be allowances, permits, offset credits, or other instruments representing absolute tons of emission reductions elsewhere) and tendering those for compliance with their emissions limitation obligations. The assurance that an emission reduction undertaken in one place (or time) is environmentally equivalent to a reduction undertaken in a different place (or time) creates fungible units that can be exchanged in a market-based environmental policy framework. The scarcity occasioned by the binding quantitative limits on emissions drives demand for these fungible emissions units. And the combination of these two elements spurs innovation in the development of new approaches for reducing emissions and competition to drive down the cost of those new approaches.

One reason that interest in climate clubs has focused on carbon markets is that climate change mitigation itself can never be constructed as a purely private good, because the reduction of emissions in any country or group of countries will always redound to the public's benefit. Other countries cannot be excluded from the benefits of climate change stabilization achieved by those committed to action. The prospect that the (presumably costly) actions of some would deliver benefit to all, including free-riders, could have the effect of deterring investment in climate mitigation. To overcome this problem, one aim of a climate club will therefore be to make aspects of climate change protection an excludable (private) good, so that investment in that aspect becomes valuable and thereby encourages the "some" to make more such investments even though the investments redound to the benefit of "all."¹⁵

Carbon market clubs seek to do just that by offering their members the opportunity to reduce emissions faster, with greater innovation, at lower cost, provided that the members make the initial investment in similarly ambitious emissions commitments and in high integrity environmental market infrastructure. These benefits accrue because of the gains from trade countries would realize from joining a club and thus linking their carbon markets to those in other countries. Countries, industries, companies, and business units with relatively abundant low-cost opportunities to reduce emissions, or that develop new ideas, technologies, and processes for cutting emissions, would gain from being net sellers of emission units to the rest of the club; those with higher costs or more difficulties accessing emission reductions could gain from being able to meet their targets at lower cost, by purchasing units generated elsewhere.¹⁶

A carbon market club could create additional excludable benefits through provisions such as enhanced foreign direct investment in clean energy, funding for capacity-building, provision of technical assistance, and reputational benefits.¹⁷ Stated differently, carbon market clubs have

the potential to create strong incentives for countries to undertake more ambitious emission reductions, using the attractant of carbon market access as well as other potential “club goods.”

With these basics in mind, core design features suggested for a club of carbon markets include common or reciprocal standards among members for carbon market infrastructure, transparency, and environmental integrity. Features could include:

- Emission caps or targets defined as emissions budgets over some minimum duration, covering all or a significant portion of a jurisdiction’s emissions of one or more greenhouse gases, denominated in tons of CO₂ or CO₂-equivalent;
- The use of emission trading to meet the caps, with mutual recognition of members’ emissions units;
- Jurisdictional law requiring covered entities to comply and imposing clear, strong penalties for non-compliance;
- Institutional capacity to enforce the cap;
- A commitment to transparent monitoring, reporting, and verification of emissions and transactions; sharing of experience and assistance in capacity-building; and
- Promotion of cross-border investment in low-carbon development.¹⁸

Of course, much as nations undertaking free trade talks evaluate the ambition of each other’s offers to reduce tariffs, jurisdictions considering a club of carbon markets will wish to evaluate the ambition of prospective participants’ emissions targets and will be more open to forming such clubs if the offered targets are perceived to be of comparable ambition.¹⁹

Lessons from other “Club” Policy Structures: Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the Montreal Protocol

In considering potential design features that institute exclusivity as a means of addressing the free rider problem, it may be useful to examine the elements of multilateral environmental agreements that draw upon both club theory and principles of market-based environmental policy for their formation. Here we consider two such agreements, the 1972 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol).

Illegal wildlife trade (including illegal logging) is vast and ranks only behind illegal trafficking in drugs, arms, and human beings.²⁰ Massive quantities of legal wildlife trade add to the pressure on species' survival. Between 2005 and 2014, nearly 18 million live, wild-sourced animals were traded legally worldwide.²¹ CITES, which has some 183 Parties, requires each Party to establish scientific and management authorities with responsibilities, inter alia, to assess the impact of proposed trades on species' survivability. It also requires the publication of transparent information on trade in species and on species populations. Further, it provides extensive support for technical assistance and capacity building.

CITES places quantitative limits, including outright bans, on trade among its Parties in specimens of and products made with species listed in Appendices to the Convention that the CITES Parties have agreed are threatened or in danger of extinction. To date, the CITES Appendices list some 35,000 species of plants and animals for protection.²² The CITES trade restrictions are implemented through a permitting system covering all of these species, which all Parties are required to enforce. CITES also bans trade in the species with non-Parties to the treaty, although this ban is not absolute: trade is allowed with non-Parties that have instituted comparable measures for species protection. The Conference of the Parties to CITES has elaborated more detailed requirements for comparability.²³ A CITES Standing Committee can,

and occasionally does, recommend that Parties suspend trade with members that are persistent offenders, in effect treating them as non-Parties who have failed to institute comparable measures.²⁴ Thus, trade measures lie at the core of the agreement, and create a degree of excludability in the club theory sense.

The Montreal Protocol freezes, and then phases out, the calculated consumption of specified chemicals that deplete the ozone layer. Because the Protocol defines calculated consumption as production plus imports minus exports, these control measures of the Protocol are in effect trade measures among the Parties, limiting exports and imports, as well as production, to achieve the mandated reductions. Developing countries that also have low per-capita consumption of the chemicals are accorded a 10-year grace period under the Montreal Protocol to complete their phase-outs.

To help facilitate the phase-outs, the Montreal Protocol establishes a technical and economic advisory panel to pool research findings on essential uses and substitutes for those. The Montreal Protocol's entry-into-force requirements (entry into force of the underlying framework agreement, the Vienna Convention for the Protection of the Ozone Layer, plus ratification of the Protocol by 11 countries representing two-thirds of global consumption of the chemicals) ensured that a significant trading bloc of producers and consumers of the chemicals and their substitutes would participate. In that sense, the Protocol operates as an optimal inclusion club.

As an exclusive club, the Montreal Protocol not only restricts Parties' import and export of the controlled chemicals, it also bans them from trading these chemicals with non-Parties. Montreal Protocol Article 4 (1987 and amendments).²⁵ Trade with non-Parties may be permitted if the non-Parties have been determined, by a Meeting of the Parties, to be in full compliance

with the Protocol's control measures and have submitted data to that effect.²⁶ The combination of the entry-into-force requirements, the freeze covering imports and exports (as well as production), and the Protocol's ban on trade with non-Parties, together comprise a suite of trade-related measures that combine inclusivity and exclusivity.²⁷

Recent scholarship has emphasized the potential role of a range of trade measures against non-Parties as potential exclusivity features that could be included in climate clubs.²⁸ If not carefully drawn, however, such trade measures could conflict with the rule-based framework of the multilateral system of trading in products and services. Therefore, it makes sense to consider whether, when seen against the backdrop of WTO rules, the effectiveness of trade bans with non-parties is so crucial to the success of market-based environmental agreements that it would be essential to include them in the design of a club of carbon markets. Then, if the effectiveness of these instruments turns on trade measures, the next step would be to consider how such measures could be designed so as not to conflict with — or to have the least amount of tension with — the rules of international trade. It turns out that, for both CITES and the Montreal Protocol, the trade provisions are narrowly drawn in order to minimize tensions with the WTO, and the evidence for the centrality of these agreements' trade measures is mixed.

The WTO, CITES, and the Montreal Protocol

The core rules of the General Agreement on Tariffs and Trade (GATT) of 1947 were incorporated into the 1994 GATT as part of the World Trade Agreements administered by the World Trade Organization (WTO) and remain in force today. These include, inter alia, prohibitions on quantitative restrictions on trade in covered products and services; requirements not to discriminate among “like products” based on whether the products were produced in

particular countries; agreements not to raise tariffs above bound levels; and limited exceptions to these requirements, including a demonstration that any conflicting environmentally-purposed trade measure be necessary, drawn in the least trade-restrictive manner, and not applied in an arbitrary or unjustifiable manner or as a disguised restriction on trade. Articles I, II, III, XI and XX of the GATT 1994 as incorporated into the WTO Agreements.²⁹

Seen against the GATT backdrop, it is apparent that the trade-with-non-Party provisions of CITES and the Montreal Protocol are very narrowly drawn. They operate, in essence, as market-access restrictions. The inclusivity aspect means that Parties to the Montreal Protocol gain market access to gradually reduced trade in ozone-depleting substances, and CITES Parties gain access to scientifically managed species trade. The exclusivity aspect means that Parties cannot trade with non-Parties in the products whose consumption has been broadly agreed to be environmentally damaging. To the extent that a ban on trade in these with non-Parties raises concerns under WTO non-discrimination rules, the fact that the agreements expressly allow such trade with non-Parties that have implemented comparable measures dampens the potential tensions with the WTO, and to date, no government has contested them in the WTO. While the Protocol authorizes a broader ban covering trade in products made with, but not containing, ozone-depleting chemicals, increasing the possibility of friction with the WTO rules, the Parties have never put this provision into effect.

The Centrality of the Trade Measures in CITES and the Montreal Protocol

Experts observe that “CITES has been widely regarded as one of the most effective international environmental treaties in existence.”³⁰ While controlling trade in the species covered by the agreement is the central aim of the agreement, the success of CITES is not measured primarily in

terms of reductions in trade qua trade, but rather in terms of the survival of listed species. As such, the effectiveness of the CITES trade measures depends greatly on the capacity-building support provided by the treaty, paired with strong education programs on the ground in key countries. Moreover, political and economic stability in those countries is also an important factor.³¹ Third party monitoring by organizations like TRAFFIC play a critical role in exposing illicit trade, sometimes at great risk to the monitors.³² At the same time, extensive analyses demonstrate that large-scale illicit trade persists; such trade is continuing to threaten species; and the effectiveness of CITES depends crucially on the capacities of its member states. Two extensive recent multi-country analyses of CITES implementation conclude that much work remains to be done to strengthen domestic legislation and improve prosecutorial and judicial capacity and process, including on-the-ground enforcement.³³ Policies that increase community-level education and ensure that wildlife protection directly empowers local people are urgently needed.³⁴ In the absence of such reforms, it is likely that illegal wildlife trafficking and concomitant endangerment of species will continue.

The Montreal Protocol also has been justly praised as among the most effective environmental agreements in the world. With essentially universal participation in the Protocol, it is the combination of freeze-and-phase-out obligations on all Parties (with the 10-year grace period), coupled with technical support, capacity-building, and transition assistance provided by the Protocol's Multilateral Fund, rather than the restrictions on trade with non-Parties, which have been primarily central to its success.³⁵ Such findings underscore the important contribution to club stability that mechanisms for pooling research funding and results, and promoting technology diffusion, can make.³⁶ Of course, simply sharing information and funding does not, in and of itself, make for an effective agreement, as the failed example of the Asia-Pacific

Partnership on climate change illustrates.³⁷ Moreover, recent evidence indicating that chlorofluorocarbon production may be increasing again, in breach of the Protocol's obligation to cut and zero out calculated consumption, raises cause for concern.³⁸ If the source of the increase turns out to be illicit production for domestic consumption purposes in one or more large countries, that illicit production may be unrelated to the Protocol's trade measures and may be principally the result of lax domestic enforcement.

Climate Clubs: A Continuum of Exclusivity Proposals

Notwithstanding the equivocal evidence about the role of exclusivity measures in the Montreal Protocol and CITES, several commentators have argued in the case of climate clubs that trade measures should be used to provide exclusivity and thereby address the "free rider" problem. These proposals can be arrayed on a continuum: on one end, broad trade measures that, if enforced, would provide very strong incentives for club membership but would raise significant questions about feasibility and compliance with WTO disciplines; on the other end, more tailored measures that would be easier to implement and more likely to withstand WTO scrutiny, at the cost of creating weaker incentives.

At the strong end of the continuum is the approach put forward by Professor William Nordhaus. He has proposed that participants in a climate club jointly agree to apply domestic carbon taxes and deter free-riding by imposing uniform percentage tariffs on the imports of all products from nonparticipants into club countries.³⁹ Similar proposals have been analyzed by Professor Barrett and his colleagues.⁴⁰

A narrower approach suggested by Professor Mehling and colleagues would be to apply carbon charges in the form of border carbon adjustments applied to imported products based on

the foreign products' overseas carbon footprint (carbon emissions released during their manufacture).⁴¹ In Professor Mehling's words, "The [border carbon adjustment] BCA is only meant to adjust for the differential between the foreign and domestic climate policy cost in covered sectors."⁴² Its purpose, then, is explicitly economic, albeit for an environmental goal to ensure, as Professor Mehling says, that "producers lose incentives to manufacture goods in places with less regulation."

Of course, an initial question that such systems would need to deal with is: precisely what constitutes free riding such that border adjustment would be justifiable? As Jason Bordoff points out, it will not be easy to determine which countries have comparable climate change policies. In the case of a carbon tax of the type proposed by Professor Nordhaus, "a government could cut excise taxes on fossil fuels while imposing a carbon tax. The after-tax cost of using fossil fuels ... would be unchanged, but the country could argue that it has implemented a comparable climate policy."⁴³ Professor Bordoff notes that requiring all importers to pay the difference between the U.S. carbon price and the carbon price in their home country could be "massively complex and likely unworkable."⁴⁴ But applying a nominally uniform border carbon tax on imported goods without regard to the carbon policies in the country of origin could be discriminatory in practice.

Moreover, a significant issue with these approaches is that they are explicitly aimed at leveling out cost differentials among products based on whether the products were produced in nations and sectors with climate change policies. This raises at least two concerns. First, crafting such approaches expressly for the purpose of addressing cost differentials raises significant tension with the tariff binding commitments of Article II of the WTO, under which nations have pledged not to raise tariffs above bound levels.⁴⁵

Second, because market-based environmental policies aim to spur innovation in and competition among new technologies and processes to achieve more environmental protection at less cost, trade measures that seek to reduce cost differentials would seem to be in tension with this goal. A key issue in this respect is how the cost differential is calculated. Where explicit carbon prices exist (e.g., a carbon tax or market price of emission allowances), they provide a reliable metric of marginal cost (although even then exemptions and free allocation must be considered to assess the true total cost, as Mehling et al. acknowledge).

If, however, cost differentials are calculated on the basis of implicit shadow prices that result from conventional command-and-control regulations, they will reflect not only underlying disparities in the actual cost of abatement but also the regulatory inefficiencies introduced by policy. For example, a home country with relatively costly conventional command-and-control regulations might seek to impose a border adjustment on imports from a country with a carbon market or carbon tax that achieved greater environmental protection at a lower marginal cost. Where explicit carbon prices are lacking, tailoring border measures to take account of actual differences in costs of environmental protection (e.g., arising from geographic variability in the cost of inputs) will require significant economic analysis and inference. These difficulties, in turn, may signal complications in getting such measures to be recognized as meriting acceptance under GATT Article XX's Exceptions provisions. One could imagine a WTO panel questioning whether such approaches are really a disguised restriction on trade, aimed in fact at ensuring, to paraphrase Professor Mehling, that producers lose incentives to manufacture goods in places with less costly regulation even if the less costly places have more environmentally effective – but cheaper – regulation.

Brian Chang, by contrast, focuses on an explicitly environmental concern, namely that non-members, by increasing their emissions, could undermine members' climate change protection efforts. He notes that the Parties to the Paris Agreement, in Article 6.1, "recognize that some Parties choose to pursue voluntary cooperation in the implementation of their nationally determined contributions [NDCs] to allow for higher ambition in their mitigation and adaptation actions and to promote sustainable development and environmental integrity."⁴⁶ Consonant with that provision, Chang proposes that a group of Parties to the Paris Agreement voluntarily and cooperatively (a) adopt a multilateral border carbon adjustment, which they would apply to carbon-intensive products; (b) exempt from their border carbon adjustment products imported from Parties that are implementing their nationally determined contributions (NDCs) under the Paris Agreement; and (c) further exempt from the border carbon adjustment products imported from sub-national entities or foreign companies that apply for such exemption on the grounds that they are participating in comparable emission reduction initiatives. Chang further proposes that the Parties to this multilateral voluntary cooperative arrangement direct revenues from the adjustment toward supporting capacity-building, mitigation, adaptation, and resiliency, particularly among developing country members of the club. As Chang's proposal is explicitly aimed at addressing environmental concerns, rather than at leveling the economic playing field, it might be more acceptable from a WTO perspective and more environmentally effective overall.⁴⁷ Of course, Chang's proposal is also vulnerable to the criticism that, given the Paris Agreement's decentralized structure, there is no assurance that countries' NDCs represent comparable effort. In other words, his proposal solves the problem that vexes Mehling and Nordhaus by largely side-stepping the question of "comparability."

An even more finely tailored proposal was made, a decade earlier, for the design of a new treaty or other agreement establishing a club of nations that would mutually agree to adopt carbon emissions limits, implement a market-based measure amongst themselves, and require that carbon-intensive products produced in non-club jurisdictions to surrender, at import, emissions allowances sufficient to cover their greater carbon footprint.⁴⁸ A provision along these lines was included in the American Clean Energy and Security Act, which passed the U.S. House of Representatives in 2009. While a proposal similar to the American Clean Energy and Security Act's provision could be paired with an allowance auction generating revenues that could be directed toward the capacity-building, mitigation and adaptation support, and resiliency called for in the Chang proposal, significant questions related to the WTO and practicability may remain.⁴⁹ Yet, from a WTO perspective, such a tailored approach might more acceptable than broader measures like those proposed by Nordhaus and Barrett.⁵⁰

Seen on a continuum from most trade restrictive to less trade restrictive, these proposals all reach more broadly than the narrowly drawn Montreal Protocol and CITES exclusivity provisions. As noted above, the Montreal Protocol and CITES provisions ban Parties from trading with non-Parties only in those products whose trade directly forms the basis of the environmental concern. By contrast, the Nordhaus proposal, by applying border tariffs to all products regardless of their nexus to climate change protection, would cover a huge range of products whose trade is already subject to WTO rules, including commitments not to raise tariffs above bound levels. To the extent that it penalizes nations, including those nations that reduce emissions more effectively but at less cost than club members, it would be vulnerable to charges that it arbitrarily and unjustifiably discriminates among countries. It therefore raises the sharpest GATT/WTO tensions.

The Mehling, Chang, and American Clean Energy and Security proposals are each successively more narrowly focused; however, because they reach potentially broad swaths of products, close attention would need to be paid to their consistency with WTO rules, on which experts differ.⁵¹ More generally, consideration of trade measures should not shift attention away from other tried and true club design elements that have demonstrably boosted participation in, and compliance with, CITES and the Montreal Protocol. In translating these policy models into the climate change arena, we would suggest a focus on the following key design features:

- Resources and capacity-building support to develop, implement, and enforce the domestic provisions of national climate change programs.
- Programs to ensure that local communities benefit from national climate change policies with an emphasis on job creation and localized benefits.
- Platforms for pooling research and development and acceleration of the deployment of alternatives.
- Funding for adaptation and resilience.
- Substantial investments in transparency, including reporting of emissions and transactions, independent on-the-ground transparency, and global satellite monitoring and reporting.

Consequently, carbon market clubs may wish to incorporate these features into their design; to the extent such clubs use exclusivity as an incentive to encourage others to join, they could make access to these resources conditional upon commitments to adopt, maintain, and implement ambitious NDCs.

Inclusivity and Exclusivity in Carbon Market Clubs: Fine Tailoring

To the extent that carbon market clubs choose to implement trade measure-based inclusivity and exclusivity provisions, the central lesson of the Montreal Protocol and CITES would be that those measures should be drawn as narrowly as possible, tailored specifically to address environmental rather than cost considerations and should be structured as much as possible to target the “stuff” of the “club” — i.e., emissions units — rather than products that may have little direct relation to the core of the agreement. As we have suggested, the narrowest way to accomplish this purpose would be a carbon market access provision — i.e., a club rule under which members would agree not to accept emission units from, or allow the transfer of units to, any jurisdiction outside of the club, unless that jurisdiction had adopted comparable rules, including a comparably stringent NDC, and provided that all club members agreed to accept units from that jurisdiction.

Such an approach would foster inclusivity in that, by joining, club members would gain access to the cost-reducing and innovation-spurring benefits of carbon markets. It would address exclusivity by restricting those benefits to nations and jurisdictions that pursue comparably ambitious goals. It is more likely that such a carbon market access approach would pass WTO muster as, arguably, carbon emission units are neither products nor services within the meaning of the GATT 1994 and WTO and thus are not directly subject to WTO disciplines.⁵² Moreover, the Paris Agreement expressly recognizes that some Parties choose to pursue voluntary cooperation to allow for higher ambition in their mitigation and adaptation actions and to promote sustainable development and environmental integrity, Paris Agreement (2015): Article 6.1. It is widely understood that such voluntary cooperation comprises market-based climate change policies.⁵³ A carbon market access provision among club members would allow for higher ambition in mitigation by supporting strong environmental integrity in transactional units.

So, it is likely that a club of carbon markets, supported by the elements noted above — including the carbon market access provisions — would be compatible and synergistic with both the Paris Agreement and the WTO.

Whether club members would agree to and apply such a carbon market access rule may soon be tested in the real world. The Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA), under development by the International Civil Aviation Organization, caps, at 2020 levels, the net carbon dioxide emissions of international flights among participating States. To meet the emissions caps, participating airlines can reduce their own emissions, purchase emission reduction units earned outside the aviation sector, or use lower-carbon alternative fuels.⁵⁴ During the first six years, participation by States is voluntary, underscoring the club-like nature of CORSIA.

Discussions are now underway in the International Civil Aviation Organization among prospective club members on how to ensure the environmental integrity of emissions units and fuels used to meet CORSIA obligations. The Council of the International Civil Aviation Organization has recently adopted a set of emissions unit criteria⁵⁵ that any emissions credit program would need to meet to be deemed eligible for use in meeting club obligations. The Council has also moved to establish a technical advisory body, called for in the International Civil Aviation Organization Assembly resolution, to review prospective emissions unit programs and make recommendations to the Council as to which emissions unit programs meet the agreed criteria.⁵⁶

One prospective club member, China, has indicated that it would prefer that each participating nation determine for its airlines which emission reduction units and programs meet the criteria.⁵⁷ China is concerned that “restricting the range of emission units available for

international aviation is most likely to push up the cost of emission reduction and provoke unfair competition in international aviation industry.”⁵⁸

Other prospective members, however, have said that, regarding the application of the criteria, there “should be no discretion or exception in their application in order to guarantee legal certainty and a level playing field between States and Aeroplane Operators.”⁵⁹ In their view, letting a club member give its airplane operators preferential access to emissions units not accepted among all club members could distort competition. Moreover, such discrimination might also run afoul of the Chicago Convention requirement that each State apply its rules without distinction as to the nationality of the aircraft.⁶⁰

Whether prospective club members can sort out these differences and launch an aviation-oriented club will provide an important test of the “some for all” thesis of the club of carbon markets approach.

Notes

¹ William Nordhaus, “A New Solution: The Climate Club,” *New York Review of Books*, 2015, <http://www.nybooks.com/articles/2015/06/04/new-solution-climate-club/>.

² Richard B. Stewart, Michael Oppenheimer, and Bryce Rudyk, “Building blocks for global climate protection,” *Stanford Environmental Law Journal* (2013): 12–43; 120 (1–2); 1–12. See generally Jon Hovi et al., “Climate change mitigation: a role for climate clubs?,” *Palgrave Communications* 2, Article 16020 (2016).

³ Jennifer Morgan, Dirk Messner, and Hans Joachim Schellnhuber, “A Renewables Club to Change the World,” *World Resources Institute*, 2014,

<http://www.wri.org/blog/2014/05/renewables-club-change-world>; Karin Baeckstrand, Fariborz Zelli, and Philip Schleifer, “Legitimacy and Accountability in Polycentric Climate Governance,” in Andrew Jordan, Dave Huitema, Harro van Asselt, and Johanna Forster, eds. *Governing Climate Change: Polycentricity in Action?* (Cambridge: Cambridge University Press, 2018), 348.

⁴ Thomas L. Brewer, “Arctic Black Carbon from Shipping: A Club Approach to Climate- and-Trade Governance,” *ICTSD Climate and Energy Research* (2015): <https://www.ictsd.org/themes/climate-and-energy/research/arctic-black-carbon-from-shipping-a-club-approach-to-climate-and>.

⁵ Todd Stern, and William J. Antholis, “Creating an E8,” *The American Interest* (2007): 43-49.

⁶ James M. Buchanan, “An Economic Theory of Clubs,” *Economica* 32 (1965): 1-14.

⁷ Paul A. Samuelson, “The Pure Theory of Public Expenditure,” *Review of Economics and Statistics* 36, (1954): 387-89.

⁸ Buchanan, “An Economic Theory of Clubs,” 2.

⁹ Stern and Antholis, “Creating an E8.”

¹⁰ Robert Falkner, “A minilateral solution for global climate change? On bargaining efficiency, club benefits, and international legitimacy,” *Perspectives on Politics* 14, no. 1 (2016): 87-101.

¹¹ Buchanan, “An Economic Theory of Clubs,” 13.

¹² Steinar Andresen, “Exclusive Approaches to Climate Governance: More Effective than the UNFCCC?,” in *Toward a New Climate Agreement*, eds. Todd L. Cherry, Jon Hovi, and David M. McEvoy (London: Routledge, 2014), 155–166.

¹³ Stewart, Oppenheimer, and Rudyk, “Building blocks for global climate protection;” David G. Victor, “The Case for Climate Clubs,” *The E15 Initiative*, (Geneva: International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum, 2015), <http://e15initiative.org/publications/the-case-for-climate-clubs/>; Thomas L. Brewer, Henry Derwentand, and Andrzej Błachowicz, “Carbon Market Clubs and the New Paris Regime,” *Networked Carbon Markets* (Washington, DC: World Bank, 2016).

¹⁴ Richard Baron and Stephen Bygrave, “Towards International Emissions Trading: Design Implications for Linkages” (Paris: OECD and IEA, 2002); Daniel Bodansky, Seth Hoedl, Gilbert E. Metcalf, and Robert N. Stavins, “Facilitating Linkage of Heterogeneous Regional, National, and Sub-National Climate Policies Through a Future International Agreement,” *Harvard Project on International Climate Agreements* (2014); Jessica Green, Thomas Sterner, and Gernot Wagner, “A balance of bottom-up and top-down in linking climate policies,” *Nature Climate Change* 4 (2014): 1064–1067; Robert Marschinski, Christian Flachslanda, and Michael Jakoba, “Sectoral linking of carbon markets: A trade-theory analysis,” *Resource and Energy Economics* (2012): 585–606.

¹⁵ Falkner, “A minilateral solution for global climate change? On bargaining efficiency, club benefits, and international legitimacy,” 87-101.

¹⁶ While all countries in a club would enjoy gains from trade, there would be winners and losers within each country (just as freer trade in goods and services creates unevenly distributed net gains). As a result, the mere fact of gains from trade does not mean that linking would be easy from a political perspective. For a discussion of the obstacles to linking, see Green, Sterner, and Wagner, “A balance of bottom-up and top-down in linking climate policies.”

¹⁷ Nathaniel Keohane and Annie Petsonk, “Creating a Club of Carbon Markets: Implications of the Trade System,” *The E15 Initiative* (Geneva, International Centre for Trade and Sustainable Development (ICTSD) and World Economic Forum, 2015), <http://e15initiative.org/publications/creating-a-club-of-carbon-markets-implications-of-the-trade-system/>.

¹⁸ Keohane, “Creating a Club of Carbon Markets.”

¹⁹ Keohane, “Creating a Club of Carbon Markets.”

²⁰ Richard Obank, Andrew Schatz, Allan Flick, Amy Heading, Staś Kuźmierkiewicz, and Emma Brookes, “Empty Threat 2015: Does the Law Combat Illegal Wildlife Trade?,” *DLA Piper* (2015): 1-498, https://www.dlapiper.com/~/_/media/Files/News/2015/05/IllegalWildlifeTradeReport2015.pdf.

²¹ Anna Heath, “Spotlight on CITES: The Convention on International Trade in Endangered Species of Wild Fauna and Flora,” *Synchronicity Earth*, October 26, 2016, <http://www.synchronicityearth.org/spotlight-on-cites>.

²² Heath, “Spotlight on CITES.”

²³ Convention on International Trade in Endangered Species of Wild Fauna and Flora, Conference of the Parties, “Trade with States not party to the Convention,” Conf. 9.5 (Rev. CoP16), 2013, <https://www.cites.org/sites/default/files/document/E-Res-09-05-R16.pdf>.

²⁴ Heath, “Spotlight on CITES”

²⁵ Edward A. Parson, *Protecting the Ozone Layer: Science and Strategy* (Oxford: Oxford University Press, 2003).

²⁶ UNEP Ozone Secretariat, *Briefing Note on Non-Party Trade Provisions, 37th OEWG*, (Geneva: UN Environment Programme, 2016), <http://conf.montreal->

protocol.org/meeting/oewg/oewg-37/presession/Background_documents/Briefing_note_on_non-party_trade.pdf.

²⁷ Annie Petsonk, "The Role of the United Nations Environment Programme (UNEP) in the Development of International Environmental Law," *American University International Law Review* 5:351 (1990).

²⁸ Victor, "Climate Accession Deals: New Strategies for Taming Growth of Greenhouse Gases in Developing Countries;" Walton Shepherd, "Accommodating the 800-Pound Gorilla: How Trade With Non-Parties Provisions Can Broaden American Participation in the 2015 Climate Agreement," *Environmental Law Reporter* 44: 10044 (2014).

²⁹ Jason Bordoff, "International Trade Law and the Effectiveness of Climate Policy: Evaluating the Effectiveness of Proposals to Address Competitiveness and Leakage Concerns," in *Climate Change, Trade, and Competitiveness: Is a Collision Inevitable?*, eds. Brainard L. & Sorkin I. (Washington, D.C: The Brookings Institution, 2009): 35-59.

³⁰ Heath, "Spotlight on CITES"

³¹ Michael Bowman, "A Tale of Two CITES: Divergent Perspectives upon the Effectiveness of the Wildlife Trade Convention," *RECIEL* 22, 3 (2013): 228-238.

³² Gail E. Rosen and Katherine F. Smith, "Summarizing the Evidence on the International Trade in Illegal Wildlife," *EcoHealth* 7 (August, 2010): 24-32.

http://wedocs.unep.org/bitstream/handle/20.500.11822/18335/Summarizing_the_evidence_on_the_international.pdf?sequence=1.

³³ Obank, Schatz, Flick, Heading, Kuźmierkiewicz, and Brookes, "Empty Threat 2015: Does the Law Combat Illegal Wildlife Trade?," Rosen and Smith, "Summarizing the Evidence on the International Trade in Illegal Wildlife," 24-32.

³⁴ Rosen and Smith, “Summarizing the Evidence on the International Trade in Illegal Wildlife,” 24-32.

³⁵ Patrick Low, “Why the Montreal Protocol is the most successful climate agreement ever,” *South China Morning Post*, October 26, 2016, <https://www.scmp.com/business/article/2040177/why-montreal-protocol-most-successful-climate-agreement-ever>.

³⁶ Carlo Carraro and Domenico Siniscalco, “R&D Cooperation and the Stability of International Environmental Agreements,” in *International Environmental Agreements: Strategic Policy Issues*, ed. C. Carraro (Cheltenham: Edward Elgar, 1997), 71–96.

³⁷ Andresen, “Exclusive Approaches to Climate Governance: More Effective than the UNFCCC?,” 155–166; Falkner, “A minilateral solution for global climate change? On bargaining efficiency, club benefits, and international legitimacy.”

³⁸ Stephen A. Montzka, et al., “An unexpected and persistent increase in global emissions of ozone-depleting CFC-11,” *Nature* 557 (2018): 413–417.

³⁹ William Nordhaus, “Climate Clubs: Overcoming Free-Riding in International Climate Policy,” *American Economic Review* 105 (2015); Nordhaus, “A New Solution: The Climate Club.”

⁴⁰ Scott Barrett and Astrid Dannenberg, “Tipping Versus Cooperating to Supply a Public Good,” *Journal of the European Economic Association* 15 no.4 (2017): 910–941, <https://doi.org/10.1093/jeea/jvw022>.

⁴¹ Michael Mehling, Harro van Asselt, Kasturi Das, and Susanne Droege, “A climate-smart solution to protectionism,” *Nature Commentary*, (2018) (in press).

⁴² Michael Mehling, Kasturi Das, Susanne Dröge, Harro van Asselt, and Cleo Verkuijl, “Policy Brief: How to Design Border Carbon Adjustments that Work for the Climate,” *Climate Strategies*, (2017), https://climatestrategies.org/wp-content/uploads/2017/10/CS_WP2-Brief_FINAL-1.pdf.

⁴³ Bordoff, “International Trade Law and the Effectiveness of Climate Policy: Evaluating the Effectiveness of Proposals to Address Competitiveness and Leakage Concerns,” 48.

⁴⁴ Bordoff, “International Trade Law and the Effectiveness of Climate Policy,” 35-68.

⁴⁵ Joost Pauwelyn, “Carbon leakage measures and border tax adjustments under WTO law,” in *Research Handbook on Environment, Health and the WTO* (Cheltenham: Edward Elgar Publishing, 2013) 448-506.

⁴⁶ Brian Chang, “A proposal for a multilateral border carbon adjustment scheme that is consistent with international trade law,” *ICTSD E15 Initiative*, June, 2017, <http://e15initiative.org/blogs/a-proposal-for-a-multilateral-border-carbon-adjustment-scheme-that-is-consistent-with-international-trade-law-if-the-trump-administration-withdraws-from-the-paris-agreement/>.

⁴⁷ Chang, “A proposal for a multilateral border carbon adjustment scheme”

⁴⁸ Michael G. Morris and Edwin D. Hill, “Trade Is The Key To Climate Change,” *The Energy Daily* 35, no.33 (2007): 1-4.

⁴⁹ Bordoff, “International Trade Law and the Effectiveness of Climate Policy,” Leakage Concerns,” 35-68.

⁵⁰ Pauwelyn, “Carbon leakage measures and border tax adjustments under WTO law;” Andrew Shoyer, “Comment on ‘International Trade Law and the Effectiveness of Climate Policy: Evaluating the Effectiveness of Proposals to Address Competitiveness and Leakage

Concerns,” in *Climate Change, Trade, and Competitiveness: Is a Collision Inevitable?* eds. Brainard L. & Sorkin I. (Washington, D.C.: The Brookings Institution, 2009).

⁵¹ Bordoff, “International Trade Law and the Effectiveness of Climate Policy,” 35-68; Shoyer, “Comment on ‘International Trade Law and the Effectiveness of Climate Policy.’”

⁵² Keohane and Peterson, “Creating a Club of Carbon Markets.”

⁵³ Susan Biniaz, “Comma but Differentiated Responsibilities: Punctuation and 30 Other Ways Negotiators Have Resolved Issues in the International Climate Change Regime,” *Michigan Journal of Environmental & Administrative Law* 6 no.1 (2016): 54-55.

⁵⁴ International Civil Aviation Organization (ICAO) Resolution A39-3: “Consolidated statement of continuing ICAO policies and practices related to environmental protection – Global Market-based Measure (MBM) scheme,” 2016, 2-8, https://www.icao.int/environmental-protection/Documents/Resolution_A39_3.pdf.

⁵⁵ CORSIA Emissions Unit Eligibility Criteria, adopted by the ICAO Council (March 2019), text available at <https://www.icao.int/environmental-protection/CORSIA/Documents/ICAO%20document%2009.pdf>.

⁵⁶ See International Civil Aviation Organization, CORSIA TAB (posted March 2019), available at <https://www.icao.int/environmental-protection/CORSIA/Pages/TAB.aspx>; and see International Civil Aviation Organization (ICAO) “Consolidated statement of continuing ICAO policies and practices related to environmental protection – Global Market-based Measure (MBM) scheme,” 2016, para. 20(d).

⁵⁷ GreenAirOnline, “China refutes reports it has withdrawn from the voluntary phases of CORSIA although its concerns remain,” July 7, 2018, <http://www.greenaironline.com/news.php?viewStory=2502>.

⁵⁸ Chinese Delegation to ICAO, *Statement on the ICAO Global Market-Based Measure Scheme*, 2016, https://www.icao.int/Meetings/a39/Documents/Resolutions/China_en.pdf.

⁵⁹ European Commission, “Reply to CORSIA State Letter,” *European Commission Directorate General for Mobility and Transport*, Brussels, 2018, <https://ec.europa.eu/transport/sites/transport/files/2018-03-01-eu-reply-to-corsia-state-letter.pdf>.

⁶⁰ International Civil Aviation Organization, *Chicago Convention on International Civil Aviation* (1944): Article 11.